Journal of Athletic Training 2000;35(3):261–267

www.journalofathletictraining.org

Acromioclavicular Joint Injuries

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Objective: To discuss the anatomy and biomechanics of the acromioclavicular (AC) joint, along with the clinical evaluation and treatment of an athlete with an AC joint injury.

Data Sources: I searched MEDLINE from 1970 through 1999 under the key words "acromioclavicular joint," "clavicle," "acromioclavicular separation," and "acromioclavicular dislocation." Knowledge base was an additional source.

Data Synthesis: AC joint injury is common in athletes and a source of significant morbidity, particularly for athletes in overhead sports. Because this injury can masquerade as other shoulder conditions, the examiner must understand the anatomy and biomechanics of the shoulder in order to perform a systematic clinical evaluation and identify the injury.

Conclusions/Recommendations: Careful attention to the clinical evaluation allows the clinician to categorize the athlete's AC joint injury and institute appropriate treatment in a timely fashion, thus permitting the athlete to return to sport as quickly and safely as possible.

Key Words: acromioclavicular ligaments, coracoclavicular ligaments, acromioclavicular joint separation, clavicle fracture, sternoclavicular dislocation, distal clavicle osteolysis, acromioclavicular joint degenerative disease

The acromioclavicular (AC) joint is a diarthrodial joint, only 1 of the 5 joints that make up the complex arrangement of the shoulder. Together with the sternoclavicular joint, the AC joint provides the upper extremity with a connection to the axial skeleton. Injuries to the AC joint are very common in athletes and a source of significant morbidity. AC pathology particularly affects athletes whose sport demands overhead upper limb activity. These problems are most frequently encountered in contact sports and are far more common in males; they may be responsible not only for aesthetically unpleasant deformities of the clavicle but also for pain, fatigue, and muscle weakness.

The treatment of injuries to the AC joint has been controversial since the time of Hippocrates (460 to 377 BC).[1] Rockwood's modern classification includes 6 types.[2] Many treatment options have been proposed in the literature,[3] targeted toward the different types of injuries, but it is difficult to compare the different series. An understanding of the anatomy and an accurate clinical diagnosis are critical for the development of a successful treatment plan to address the injuries and degenerative changes that can affect the AC joint. AC joint pain may masquerade as other conditions in the shoulder; therefore, the pathology must be thoughtfully sought. Careful clinical examination and basic radiographic imaging help to direct a clinically effective approach to these problems.

ANATOMY

The AC joint, which is approximately 9 mm by 19 mm, is a diarthrodial joint with various angles of inclination in both the sagittal and coronal planes.[4,5] The articular surface of the acromial end of the clavicle is hyaline cartilage until 17 years of age, at which time it acquires the structure of fibrocartilage. Similarly, the articular surface of the clavicular surface of the acromion becomes fibrocartilage at approximately 23 years of age.[6] Viewed anteriorly, the inclination of the joint may be almost vertical or downward medially, the clavicle overriding the acromion by an angle of as much as 50°. Moseley[7] suggested an underriding type of inclination with the clavicle facet under the acromion process, and in his experience, the vertical and underriding types of facets appeared to be most prone to prolonged disability after injury. Urist[8] studied 100 random radiographs of the shoulder and found that the articular surface of the clavicle overrode the articular surface of the acromion approximately 50% of the time.

The meniscus of the AC joint is poorly understood, and little is known of its biomechanical role. The AC joint has similar morphology to the sternoclavicular joint but more commonly has an incomplete fibrocartilaginous disc. This may be one of the reasons why degenerative changes affect this joint more frequently than they do the sternoclavicular joint. Because of the small area of the AC joint and the high compressive loads transmitted from the humerus to the chest by muscles such as the pectoralis major, the stresses on the AC joint can be very high. As a result, the distal clavicular articular surface is prone to compressive failure, as seen in osteolysis of the distal clavicle in weightlifters. Degenerative changes in the disc increase in frequency with patient age, and the disc undergoes rapid degeneration, until it is essentially no longer functional beyond the fourth decade.[9]

The AC joint and the entire shoulder girdle are stabilized by the ligaments that surround the joint (Figure 1). The AC joint is surrounded by a thin capsule that is reinforced above and below by the superior and inferior AC ligaments and the anterior and posterior AC ligaments. Acromioclavicular stability is maintained by the coracoclavicular ligaments (conoid and trapezoid) in addition to the AC capsule and ligaments. The superior and inferior AC ligaments provide the joint with horizontal stability. Codman[10] observed that AC joint motion was minimal and generally equivalent to the pliability of the ligaments. He noted that the AC joint "swings a little, rocks a little, twists a little, slides a little, and acts like a hinge."[10]

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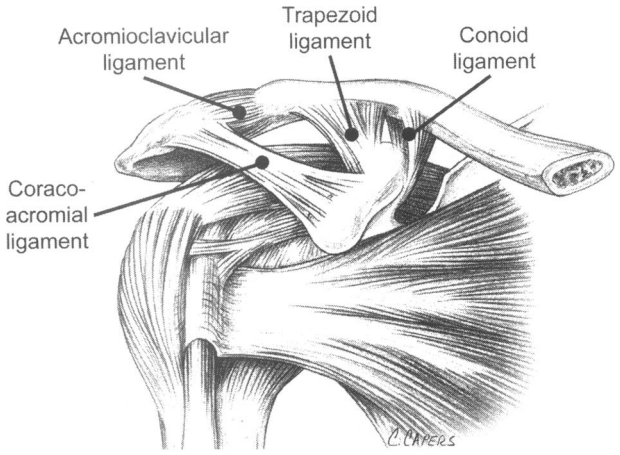

Figure 1. Ligamentous structures surrounding the acromioclavicular (AC) joint: acromioclavicular, trapezoid, conoid, and coracoacromial. The trapezoid and conoid ligaments make up the coracoclavicular ligament complex.

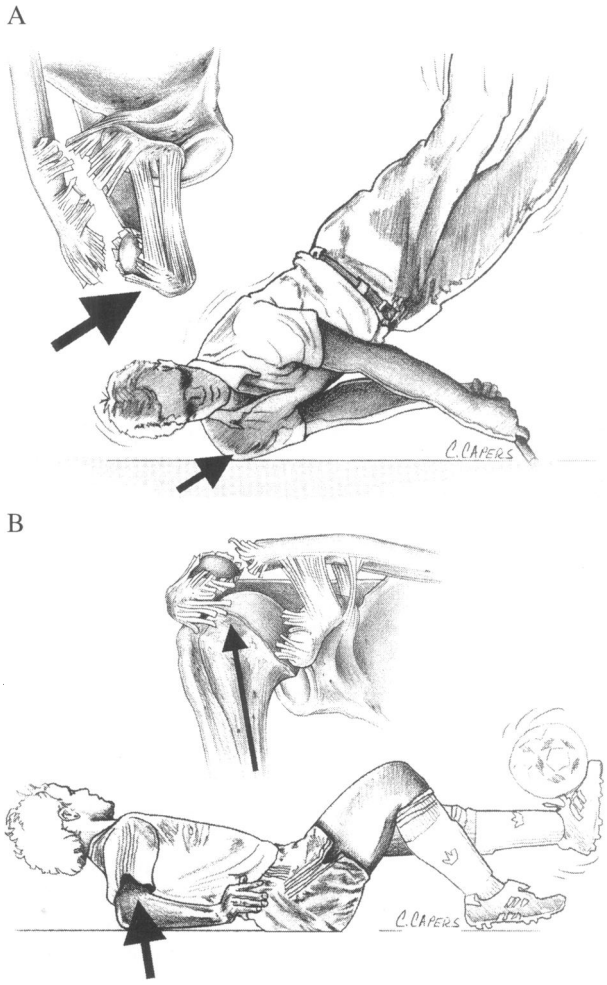

Figure 2. A, The most common mechanism of injury to the acromioclavicular (AC) joint is from a direct force onto the point of the shoulder. B, Indirect forces to the AC joint can also cause injury. For example, a fall onto the elbow can drive the humerus proximally, thus disrupting the AC joint. In this case, the strain is referred only to the AC ligaments and not to the coracoclavicular ligaments.

Rockwood[11] and others have found little relative motion between the acromion and the clavicle during studies with percutaneous implanted pins in volunteers. Rockwood described a synchronous, 3-dimensional linkage of clavicular and scapular rotation: the clavicle does rotate, but the scapula rotates with it, so that there is very little relative motion of the clavicle and scapula. Thus, most scapulothoracic motion occurs through the sternoclavicular joint. The clinical significance of this is that AC fixation may be rigid without necessarily producing an obligate loss of shoulder motion.[12] Fukuda et al[13] performed a cadaver study of the ligamentous structures of the AC joint, carrying out load-displacement tests along with sequential sectioning of the ligaments. They found that the AC ligament acted as a primary constraint for posterior displacement of the clavicle and posterior axial rotation. The conoid ligament appeared to be more important than has been previously described, in that it played a primary role in constraining anterior and superior rotation as well as anterior and superior displacement of the clavicle.

The fibers of the superior AC ligament blend with the fibers of the deltoid and trapezius muscles, which are attached to the superior aspect of the clavicle and the acromion process. These muscle attachments are important in strengthening the AC ligaments and adding stability to the AC joint.[2]

CLINICAL EVALUATION

Mechanism of Injury

Injury to the AC joint most commonly occurs as a result of direct force produced by the patient falling on the point of the shoulder onto the ground or firm object with the arm at the side in the adducted position (Figure 2). The most common events associated with AC injuries include contact sports such as hockey, rugby, and football. Webb and Bannister[14] noted a 45% incidence of AC injuries in first-class rugby players, and most did well with conservative treatment. The direct force of striking the point of the shoulder drives the acromion downward. Bearn[15] has shown that the downward displacement of the clavicle is primarily resisted through an interlocking of the sternoclavicular ligaments. The clavicle remains in its normal anatomic position, and the scapula and shoulder girdle are driven inferiorly. The result, then, of a downward force being applied to the superior aspect of the acromion is either give-way of the AC and coracoclavicular ligaments or clavicle fracture. There may be an additional anteroposterior direction to the force. AC joint injuries consist of a continuum of ligament injuries, beginning with a mild sprain of the AC ligaments. Then the AC ligaments tear, followed by stresses to the coracoclavicular ligament. Finally, if the downward force continues, tears of the deltoid and trapezius muscle attachments occur from the clavicle, as well as ruptures of the coracoclavicular ligament (Figure 3). When these structures tear, the upper extremity has lost its ligamentous support from the distal end of the clavicle, and it droops downward. With severe force, the skin overlying the AC joint can also be disrupted. In the rare type VI injury to the AC joint (see below), a different mechanism of injury is responsible (Figure 3G). A severe direct force onto the superior surface of the distal clavicle along with abduction of the arm and retraction of the scapula has been described.[16] The clavicle is driven inferiorly, where it lodges beneath either the acromion or the coracoid.

Indirect forces to the AC joint may also be responsible for injury. An upward force to the AC joint can occur from a fall

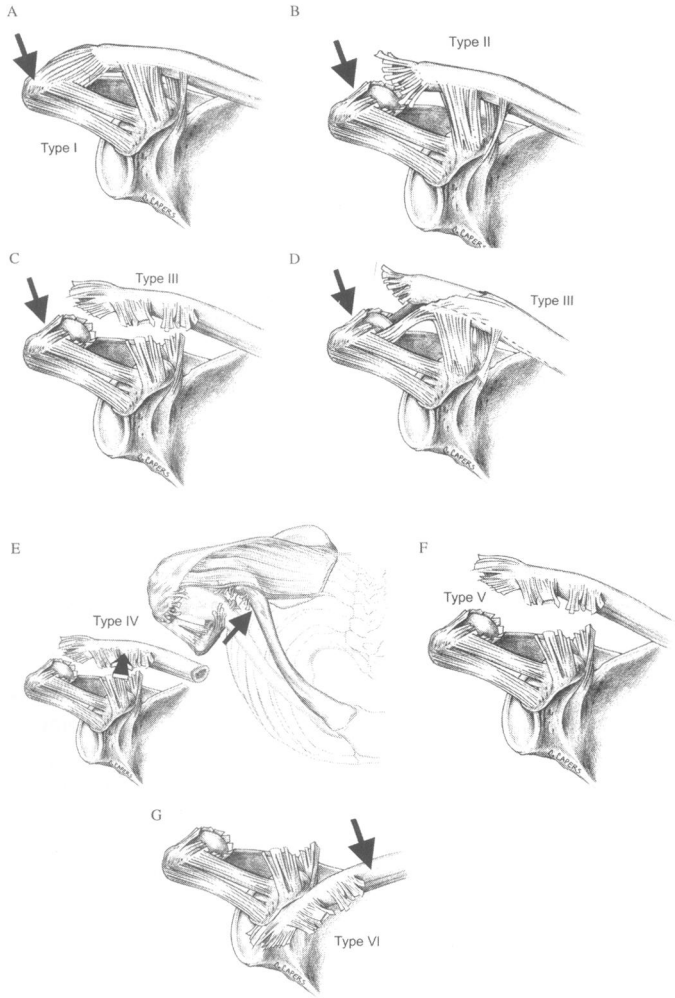

Figure 3. Acromioclavicular (AC) ligament injuries: types I–VI. A, Type I: minor AC ligament sprain. The ligaments are intact and the joint is stable. B, Type II: rupture of the AC ligament and sprain of the coracoclavicular ligaments. The distal clavicle is unstable. C, Type III: rupture of both the AC and the coracoclavicular ligaments. The joint is unstable. D, Type III: displacement of the distal clavicle through a tear in the periosteal tube. This can occur in children who sustain a severe force to the shoulder. The AC and coracoclavicular ligaments remain intact to the periosteal tube. E, Type IV: tears of both the AC and the coracoclavicular ligaments with posterior displacement of the distal clavicle. The distal clavicle may become interposed within the fibers of the trapezius muscle. F, Type V: tears of both the AC and the coracoclavicular ligaments with superior displacement of the distal clavicle. G, Type VI: tears of both the AC and the coracoclavicular ligaments with subcoracoid or subacromial displacement of the distal clavicle.

on an outstretched hand transmitting up the arm through the humeral head into the acromion process. The strain is referred only to the AC ligaments and not to the coracoclavicular ligaments, thus producing isolated AC joint injury (Figure 2B). A downward force by a pull through the upper extremity while carrying a heavy load may also cause AC joint injury; however, this is a very uncommon mechanism.

History and Physical Examination

The history should be focused toward the age of the patient and the mechanism of injury. In addition, postinjury performance, as well as a history of prior injury, patient occupation, and type of sporting activities performed in the past, is important to understand. The patient's level of activity may play a role in treatment decision, and is, therefore, a crucial component of the history.

The physical examination should begin with careful observation of the patient's shoulder without any obstruction from clothing or improper gowning. Inspect the shoulder contour with the patient in the seated position in order to accentuate any deformity that may be present at the AC joint (Figure 3). View the shoulder from both superior and anterior positions in order to note any subtle anteroposterior displacements of the AC joint. Carefully palpate the sternoclavicular joint, clavicle, and AC joint to appreciate any subtle deformities and to elicit focal areas of tenderness. In addition, palpate for soft tissue defects. If there is obvious subluxation or dislocation of the AC joint, attempt a gentle reduction by supporting the ipsilateral arm and depressing the distal clavicle in order to establish the type of AC injury (see below). Finally, identify and record the neurovascular status of the extremity.

Classification of AC Separations

The classification scheme for AC separation described by Rockwood and Young[2] is well accepted. Six types of injury are classified according to the degree of displacement of the distal clavicle, the involvement of the AC and coracoclavicular ligaments, and the integrity of the fascia overlying the deltoid and trapezius musculature (Figure 3).

Type I. Type I AC separations occur secondary to a mild force to the point of the shoulder, which produces a minor strain to the fibers of the AC ligaments. The AC joint remains stable, and the ligaments are intact. On physical examination, AC joint tenderness is minimal to moderate without palpable deformity.

Type II. Type II AC separations result from a moderate force to the point of the shoulder, yet severe enough to rupture the AC ligaments. The distal end of the clavicle is unstable, but the coracoclavicular ligaments are intact. The scapula may rotate medially, widening the AC joint. If the coracoclavicular ligament is mildly stretched, slight downward displacement of the scapula from the distal end of the clavicle may be apparent. On physical examination, pain at the AC joint can be moderate to severe. The outer end of the clavicle may be slightly superior to the acromion. Shoulder motion produces pain in the joint, and the coracoclavicular space is tender to palpation. Manipulation of the clavicle in the horizontal plane may result in subtle motion detectable with palpation of the AC joint.

Type III. Disruption of the AC and coracoclavicular ligaments occurs after a severe force is applied to the point of the shoulder. In children, the AC and coracoclavicular ligaments may remain intact to the periosteal tube of the clavicle, and the clavicle is displaced out of the periosteal tube, secondary to a longitudinal split in the periosteal sleeve (Figure 3D). The mechanism for this injury is similar to that described above. The deltoid and trapezius muscles are disrupted from the distal end of the clavicle, or the periosteal sleeve with muscle attachments may be separated from the outer end of the clavicle. On physical examination, a type III injury may be less painful than a type II injury, in which the distal clavicle is unstable, yet is still contained in the region of the acromion by the intact coracoclavicular ligaments, allowing abnormal movement between the 2 bones and resulting in irritation and pain. The patient often presents with a depressed upper extremity compared with the normal shoulder, and the distal

end of the clavicle may be prominent enough to tent the skin. Abduction generally causes the most severe pain in this injury. In type III AC separations, the distal clavicle can be manually reduced into its anatomical location; however, it will remain unstable when the pressure is removed. (Figure 4).

Type IV. This injury is similar to a type III AC separation except that the distal clavicle is displaced posteriorly and may even be locked within the fibers of the trapezius muscle. The physical examination is similar to that in type III injuries, although the patient will present with significantly more pain with shoulder motion. Observation of the shoulder superiorly may reveal that the outline of the involved clavicle is posteriorly inclined when compared with the uninvolved shoulder. Significant posterior displacement of the clavicle may tent the skin on the posterior aspect of the shoulder. A manual reduction maneuver is not possible in this type of injury, and thus, helps to distinguish it from a type III injury.

Type V. This is a very severe type III injury with disruption of the AC and coracoclavicular ligaments, as well as detachment of the deltoid and trapezius muscles from the distal third of the clavicle. As a result, the entire upper extremity droops inferiorly, making the clavicle appear very prominent. In addition to the tenderness noted in a type III injury, the patient also has pain over the distal half of the clavicle secondary to the extensive muscle and soft tissue disruption from the clavicle.

Type VI. This is a very rare injury resulting from a significant traumatic abduction force to the upper extremity. The distal end of the clavicle is dislocated under the coracoid process and is posterior to the conjoined tendons (coracobrachialis and short head of the biceps). On physical examination, the shoulder has a flattened appearance, as opposed to the rounded contour of the normal shoulder. The acromion is prominent, and the superior surface of the coracoid process can be palpated easily. Associated fractures of the clavicle and upper ribs and injury to the brachial plexus must be carefully sought due to the significant amount of trauma required to cause a type VI injury.

RADIOGRAPHIC EVALUATION

Routine radiographic projections of the AC joint have traditionally been taken using a horizontal-beam technique. This may lead to superimposition of the AC joint on the spine of the scapula, which can result in missed pathology. In addition, if the AC joint radiographs are taken by the technician with the same x-ray exposure setting used to penetrate the heavier and thicker glenohumeral joint, the resulting dark and overpenetrated x-ray of the AC joint will be difficult to interpret for AC pathology. The exposure must be reduced approximately 50% from an ordinary glenohumeral joint radiograph to maximally visualize the AC joint.

The Zanca view of the AC joint was developed to address the superimposition of the AC joint on the scapular spine.[17] The patient is positioned standing, with both AC joints projected onto a single large cassette, and a true anteroposterior view (45° angulation from the thoracic plane) with a 10° to 15° cephalic tilt is performed (Figure 5). The cephalic tilt maximizes visualization of the joint and helps to identify small fractures that may be present.

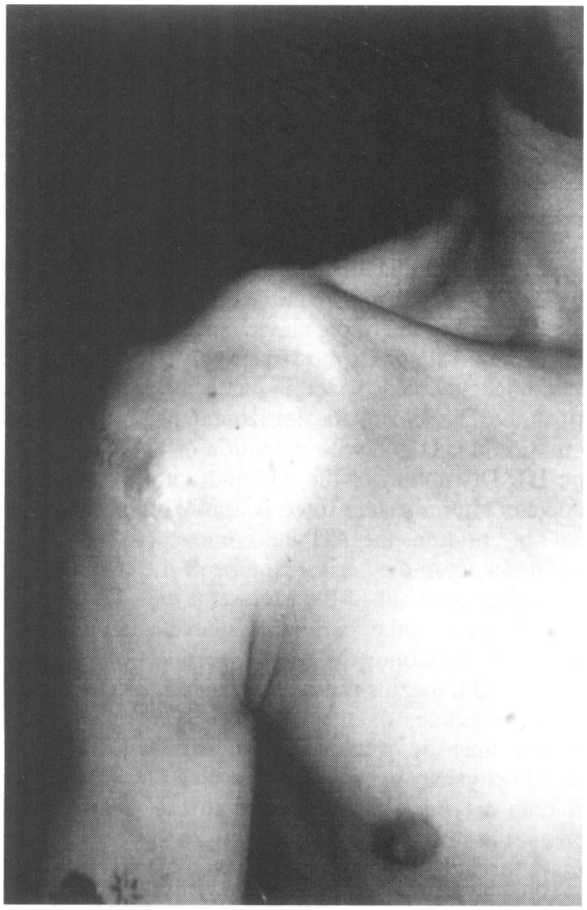

Figure 4. Type V acromioclavicular (AC) joint injury with obvious deformity of the shoulder contour.

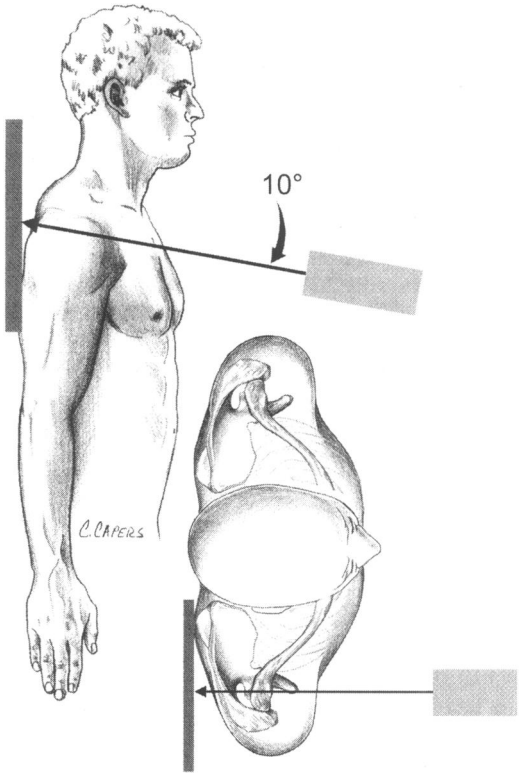

Figure 5. The Zanca view of the acromioclavicular (AC) joint. A standing, true anteroposterior view of both AC joints is performed with or without weights suspended on the forearms. A 10° to 15° cephalic tilt maximizes visualization of the joint and helps to identify small fractures that may be present.

The axillary lateral view of the shoulder is important to identify any posterior displacement of the clavicle, and it may also reveal small fractures not visible on the anteroposterior x-ray. The axillary lateral view is taken with the arm abducted 70° to 90° and the radiographic beam directed cranially. Although this view can be obtained in almost any patient, an occasional patient may be unable to abduct the arm enough for this view. Several techniques are useful in this situation.[18] The arm can usually be carefully passively abducted to allow this film to be taken. In other patients, a curved cassette can be placed in the axilla and the beam directed inferiorly onto the cassette. Alternately, the arm can be forward flexed rather than abducted. Finally, the Velpeau axillary lateral view can be obtained without even removing the injured extremity from its immobilized position. The patient is simply asked to lean backward over the edge of the radiography table where the x-ray cassette is placed, and the beam is directed from superior to inferior.

The technique for a stress radiograph of the AC joint is similar to that in the anteroposterior view with the addition of a 10- to 15-lb (4.54- to 6.80-kg) weight suspended from the forearm. Care must be taken not to allow the patient to hold the weights because proximal muscular contraction may reduce the degree of the AC joint dislocation. The average distance between the superior aspect of the coracoid process and the inferior aspect of the clavicle varies from 1.1 cm to 1.3 cm.[19] However, the coracoclavicular distance varies in normal subjects, depending on how far the patient is from the x-ray tube and cassette. Therefore, the most important measurement is the side-to-side comparison with the uninvolved side. Bearden et al[19] recommended comparing the 2 sides: an increase in the coracoclavicular distance of the injured shoulder over the normal shoulder by 40% to 50% can be considered a complete coracoclavicular ligament disruption. Rockwood and Young[2] have documented that a side-to-side difference of 25% of the coracoclavicular distance is diagnostic of a complete disruption of the coracoclavicular ligaments. Vanarthos et al[20] performed a cadaver study to establish whether an anterior/posterior (AP) x-ray with the arm in internal rotation could replace the weightbearing view to diagnose type III AC dislocations. On the basis of their model and analysis, a routine AP view obtained with the shoulder in internal rotation and without weights is sometimes sufficient for diagnosing type III separations of the AC joint. They proposed that this protocol eliminates a potentially painful procedure for the patient and saves time and film.

Bossart and colleagues[21] reviewed the stress x-rays of 82 patients who did not have an obvious type III injury of the AC joint. They only diagnosed 5 patients with type III injuries, and therefore, did not recommend routine use of stress x-rays of the AC joint.

Treatment of AC Separations

Type I. Type I AC separations are minor injuries and are generally treated conservatively with a sling for 5 to 7 days to reduce the stress on the AC joint. Ice is applied for the first 48 to 72 hours, and nonsteroidal anti-inflammatory drugs (NSAIDs) may be recommended. Immediate isometric and gentle range-of-motion exercises are encouraged. A more structured strengthening program is initiated as soon as the patient's symptoms begin to resolve. Most athletes with type I AC separations return to full activities within 1 to 2 weeks.

Type II. Soft tissue trauma in type II injuries is more extensive than in type I injuries. Treatment for type II injuries is essentially the same as for type I injuries, although the time frame is prolonged due to the greater trauma sustained. A sling is generally used for 1 to 2 weeks. Ice and NSAIDs are recommended early, and strengthening exercises may begin once symptoms have abated. The patient is informed that a mild cosmetic deformity may be present once the injury is healed. Most athletes with type II AC separations return to full activities within 2 to 3 weeks. These injuries may lead to posttraumatic degenerative joint disease. If these patients develop symptoms unresponsive to conservative management, they may do quite well with an arthroscopic or open distal clavicle resection.

Type III. Type III injuries are commonly treated nonoperatively. One exception is in the elite throwing athlete, in whom the extremes of motion and biomechanical loads placed on the shoulder at a high level of activity may be affected enough to cause a noticeable difference in performance. Acute conservative treatment is similar to that recommended for type I and II injuries, including ice, NSAIDs, and sling immobilization. The sling can be discontinued once the major symptoms have subsided, within 1 to 4 weeks. Isometric and gentle range-of-motion exercises are encouraged as soon as the patient can tolerate them, usually within the first week. Devices designed to reduce the AC joint are very uncomfortable and can often lead to skin breakdown or necrosis. These devices have not been shown to lead to better functional results than "skillful neglect."[22–24] Hughston and colleagues (J.C. Hughston, MD, unpublished data, 1999) have advocated early operative repair of type III AC dislocations. They have had excellent clinical results with this form of treatment and feel that restoration of normal anatomy is essential for a good functional result, especially in the contact athlete.

Types IV, V, and VI. Most surgeons recommend early surgical treatment for type IV, V, and VI AC dislocations. A wide variety of operative procedures has been recommended for the open treatment of both acute and chronic complete AC dislocations and is beyond the scope of this article.[9,25–27]

ASSOCIATED INJURIES

Fractures

Fractures of the acromial process, clavicle, and ribs can be associated with AC dislocations. Type VI injuries are generally caused by severe trauma and are more likely to be associated with other injuries. Distal clavicle fractures can occur in association with AC joint injuries. Neer[28] classified these fractures according to their location in relation to the coracoacromial ligaments (Figure 6). Type I injuries occur lateral to the coracoclavicular ligament complex and are quite stable (Figure 6A). Type II injuries are complex, unstable fracture-dislocations that leave the distal clavicle and the AC joint intact but separate the clavicle from the underlying coracoclavicular ligament complex through an oblique or vertical fracture (Figures 6B, 6C). Type III injuries are intra-articular fractures of the distal clavicle at the AC joint and may be an occult source of posttraumatic arthritis and pain (Figure 6D). Some more unusual associated fractures have been reported in the literature. Wurtz et al[29] reported on 4 patients with combined

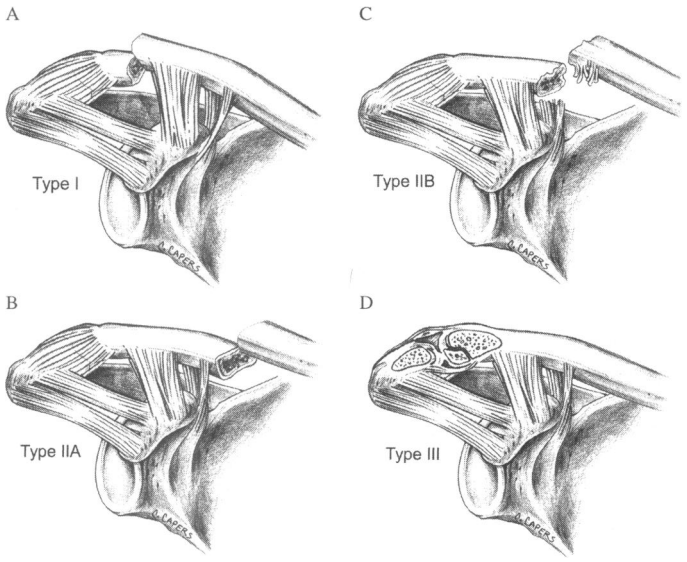

Figure 6. Distal clavicle fractures. A, Type I: stable fracture lateral to the coracoclavicular ligament complex. B, Type IIA: unstable, complex fracture-dislocation leaving the distal clavicle and the acromioclavicular (AC) joint intact but separating the clavicle from the underlying coracoclavicular ligament complex through an oblique fracture. C, Type IIB: unstable, complex fracture-dislocation through a vertical fracture. D, Type III: intra-articular fracture of the distal clavicle at the AC joint.

AC dislocations and midshaft clavicle fractures: 3 had a type IV injury, and 1 had a type II injury. They recommended treatment directed at the injuries of the AC joint. Only 3 patients with type III AC separations associated with midshaft clavicle fractures have been reported in the world literature to date. All 3 patients did well, 2 AC joints being treated surgically[30,31] and 1 conservatively.[32]

A coracoid process fracture associated with AC joint dislocation and with rupturing of the coracoclavicular ligaments in an adult has been reported only twice.[33] Two separate mechanisms, direct trauma to the shoulder girdle and a sudden pull on the coracoid process by the conjoined tendons of the short head of the biceps and the coracobrachialis muscles, appear to be responsible for this unusual triple lesion.

Sternoclavicular Dislocation

Fewer than 20 cases of combined AC and sternoclavicular dislocations (panclavicular dislocation) have been reported in the literature.[34] Nearly all of the cases reported consisted of an anterior sternoclavicular dislocation combined with a posterior type IV AC dislocation. The sternoclavicular joint should be palpated for tenderness in every routine shoulder examination. If tenderness is elicited, a serendipity view[35] of the sternoclavicular joints (AP x-ray with a 40° cephalic tilt) should be performed or a computed tomographic scan should be obtained.

Pulmonary Injury

Barber[36] described a patient with a type IV AC dislocation, an ipsilateral pulmonary contusion, and a contralateral pneumothorax. The mechanism of injury was a direct blow to the posterior aspect of the scapula. Diagnosis of this rare but serious injury, which may be associated with an AC dislocation, requires an attentive physical examination not limited to the shoulder, as well as a high index of suspicion.

OTHER AC JOINT PATHOLOGY

Distal Clavicle Osteolysis

Distal clavicle osteolysis is common in weightlifters and can follow traumatic injuries. Osteolysis is thought to be caused by repetitive microtrauma leading to subchondral stress fractures, which induce hyperemia and bone resorption as in normal healing. However, in the presence of ongoing stress, bone formation and remodeling do not occur. Flatow et al[37] described 12 patients, with an average age of 27 years, who had osteolysis of the distal clavicle. Nine of these patients were involved in weight training. Osteolysis can also occur subsequent to a type III intra-articular fracture of the distal clavicle, but this is rare.[38] Patients complain of localized pain, aching, and weakness exacerbated by weight lifting. Examination may demonstrate pain with flexion and cross-chest adduction. The classic radiographic appearance demonstrates resorption of the superior aspect of the distal clavicle with joint space widening (Figure 7).[39] Local injections into the AC joint may at least temporarily relieve the pain.

Degenerative Joint Disease of the AC Joint

AC degenerative joint disease can be isolated or may occur in conjunction with subacromial impingement syndrome. Examination most often reveals pain with cross-chest adduction, as well as localized tenderness at the AC joint with palpation. Injection of the joint with local anesthetic often relieves this pain. Clinical symptoms may not correlate with the radiographic evidence of degenerative joint disease. Therefore, the decision to intervene surgically (once nonsurgical treatment has failed) must be based on clinical findings of pain and relief with a selective local anesthetic block.

CONCLUSIONS

AC joint injuries are very common in athletes, especially those engaged in contact sports. As part of the history and physical examination, plain radiographs are very useful and

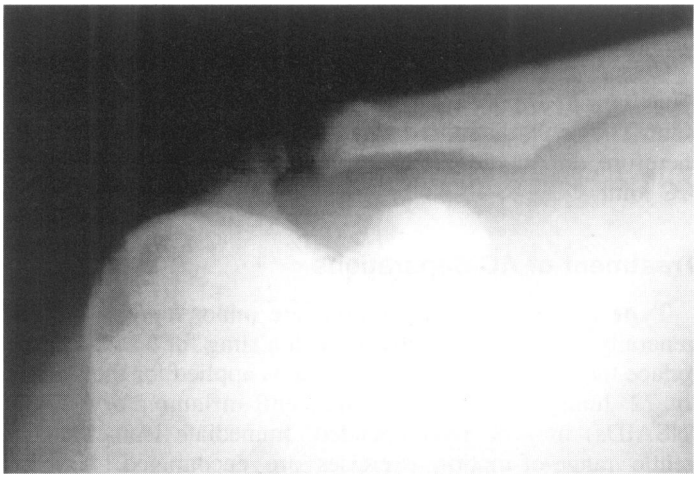

Figure 7. Radiographic appearance of distal clavicle osteolysis demonstrating resorption of the superior aspect of the distal clavicle with joint space widening.

cost effective in evaluating and classifying these injuries. The currently accepted classification system describes 6 types of AC dislocations. The type of injury dictates the treatment, whether operative or conservative, which may depend on the activity level to which the patient would like to return. A high index of suspicion for the presence of associated injuries must be present, particularly in the higher-grade injuries. Injuries to the AC joint can lead to degenerative changes and instability ranging from subtle subluxations to gross dislocations. Patients may report activity-related pain, weakness, and cosmetic deformity. A thorough understanding of the anatomy and the pathomechanics of the shoulder is vital to making appropriate treatment decisions.

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